

Docket No.: 21581-00271-US
(PATENT)

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent Application of:
Yoshiki Nakagawa, et al.

Application No.: 09/870,397

Filed: May 31, 2001

Art Unit: 1712

For: FUNCTIONAL GROUPS-TERMINATED
VINYL POLYMERS

Examiner: M. Moore

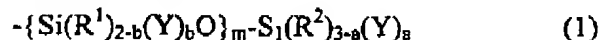
DECLARATION UNDER 37 CFR 1.131

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

Yoshiki Nakagawa, Kenichi Kitano, and Masato Kusakabe declare that we are the inventors who on July 28, 1998, filed U.S. patent application SN 09/122,896, which is the parent of the above-identified U.S. patent application, and that they made their invention in Japan prior to February 6, 1997.

We further state that prior to February 6, 1997, the present invention was reduced to practice in Japan by us and/or under our direction and/or supervision. In particular, a vinyl polymer having at least one terminal functional group per molecule and a ratio of weight average molecular weight to number average molecular weight of less than 1.8 as determined by gel permeation chromatography, wherein the terminal functional group is a crosslinking silyl group of the general formula (1) shown below,



wherein R^1 and R^2 each independently represents an alkyl group containing 1 to 20 carbon atoms, an aryl group containing 6 to 20 carbon atoms, an aralkyl group containing 7 to 20 carbon atoms, or a triorganosiloxy group of the formula $(\text{R}')_3\text{SiO}-$, R' being a monovalent hydrocarbon residue containing 1 to 20 carbon atoms and the three R' groups being the same or different,

provided that when a plurality of R^1 or R^2 groups occur, they may be the same or different; Y represents a hydroxyl group or a hydrolyzable group, provided that when a plurality of Y groups occur, they may be the same or different; a represents 0, 1, 2 or 3, b represents 0, 1 or 2, and m represents an integer of 0 to 19, provided that the condition $a + mb \geq 1$ should be satisfied, was reduced to practice by us and/or under our direction and/or supervision in Japan, prior to February 6, 1997.

This is evidenced by the attached Exhibit A which is a true copy of laboratory note page 51 with the dates being redacted which shows a reduction to practice of the present invention and namely, example 7 of the present application. The silyl-terminated polymer of the note page has a M_w/M_n of 1.74. The laboratory note page 51 was created prior to February 6, 1997 and all of the dates redacted from Exhibit A are prior to February 6, 1997.

The undersigned declare further, that all statements made in this declaration of their own knowledge are true and that all statements made on information and belief are believed to be true; and that willful, false statements and the like, so made, are punishable by fine and imprisonment, or both, under section 1001 of Title 18 of the United States Code and that such willful, false statements may jeopardize the validity of the application or any patent issuing thereon.

Date: _____

Signature: _____

Yoshiki Nakagawa

Date: _____

Signature: _____

Kenichi Kitano

Date: _____

Signature: _____

Masato Kusakabe

2004年 4月22日 15時40分

YASUOKI & ASSOCIATES

NO. 0469 P. 4 51

EXHIBIT A

Notebook No :

Date

トリービニ
プロジェクト

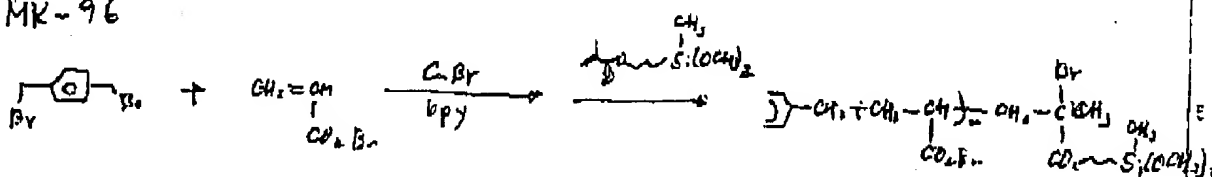
Telechelic Korytic Oligomer

Subject
072821

Synthesis of alkoxy-aryl group-containing
BA oligomer by ATRP process

From Page No.

MK-96



Concept

In the experiment HK-19, the introduction of trimethoxysilyl group was attempted. However, the obtained oligomer was cross-linked during the removal of the solvent and, thus the oligomer could not be isolated. Trialkoxysilyl groups may be too reactive and the curing reaction proceeded in the absence of catalyst. In this experiment, ~~the introduction of~~ the introduction of less-reactive dialkoxysilyl group is tried.

Material:

butyl. acrylate (5 mL, 4.47 g, 34.9 mmol)

BrC1=CC=C(C=C1)CBr (185 mg, 0.70 mmole)

CuBr_2 (100mg, 0.70mmol)

bpy (217mg, 1.46mmol)

from $\text{Si}(\text{CH}_3)_4$ (65 mg, ~~2~~ 2.5 mmol)

- ① The above mixture was degassed by bubbling N_2 for 15 min

- ② Polymerization of BA: $120^{\circ}\text{C} \times 2\text{hr}$

The reaction with $\text{Zn}(\text{CH}_3\text{COO})_2$: 100°C 2 hrs

- ③ after filtration of insoluble materials, the organic layer was washed with aq. NH_4Cl , brine, and dried over Na_2SO_4 .

" Yield 4.75g (90%)

• GPC $M_n = 7100$. $M_w/M_n = 1.74$

6. Curve Test

$\left\{ \begin{array}{l} \text{Aligment} \\ \text{U-220} \end{array} \right.$	2.11%	$r.z. \times 4 \text{ days} \Rightarrow 55\%$
	63.5%	$r.z. \times 7 \text{ days} \Rightarrow 57\%$

(517) 2011

10. 11. 2011

To Face NC

1501 1504

Produced by

Presente le nobile

1 Signed

5. Louis Tabares